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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,775	03/25/2004	Arthur Metcalfe		9599

7590 09/20/2005

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EXAMINER

ELVE, MARIA ALEXANDRA

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/810,775

Applicant(s)

METCALFE ET AL.

Examiner

M. Alexandra Elve

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____  | 6) <input type="checkbox"/> Other: ____                                     |

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**DETAILED ACTION**

***Claim Objections***

Claim 1 is objected to because of the following informalities: (line 2) the examiner has assumed for examination purposes that "shift" is a typographical error and should be "shaft". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

Claims 2-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not known what MB2-Z is?

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14, 16-20 & 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mustonen (USPN 5,262,608) in view of Donaldson et al. (USPN 5,753,574).

Mustonen discloses an underwater cutting and welding torch. The apparatus includes a first and second chamber, a hydraulic motor (in the first chamber) and an

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external source of pressurized liquid medium. At one end of the movable shaft of the motor, an elongated electrode is connected, at least a portion of which is adapted to extend out of the body through an opening in the body. Via the shaft, the motor transmits a rotating or reciprocating motion to the electrode. An electric current is conducted from an external power supply source to the electrode via an electrically conductive member, which is fitted in the second chamber around at least a portion of the electrode.

The electrode can have various shapes and cross sections. For example, circular quadrangular, hexagonal or elliptical. An elongated electrode is moved by means of the hydraulic motor in a rotating or reciprocating motion or a combination of motions. The electrode is partially surrounded by an electrical conductor disposed in the second chamber. The conductor is preferably made of graphite. Electric current is conducted from an external power supply source with a cable through the conductor to the electrode. The nozzle connected with the electrode is made of a heat resistant material such as a ceramic. (abstract, figures, cols. 1-3).

Mustonen discloses the presence of an electrode in rod and disc shapes, but does not specifically teach the composition of the electrode.

Donaldson et al. discloses a ceramic electrode having the composition  $MB_{2-z}N$ , wherein  $0 < z < 0.10$  and M is selected from the group of Zr, Hf and Ti and N is selected from the group Cu, Au and Ag.  $MB_{2-z}$  defines a ceramic matrix structure with a void volume of 10% and N occupies at least 70% of the void space. Powder is typically the starter material. (abstract, cols. 2, 6-8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the composition as taught by Donaldson et al. in the Mustonen system because it is merely a type of ceramic electrode.

Claims 15 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mustonen and Donaldson et al. as stated in the above paragraph and further in view of Yasutomi et al. (USPN 4,923,829).

Mustonen and Donaldson et al. teach an underwater cutting and welding torch with a ceramic electrode having 10% void volume, but do not disclose other void volumes or different types of started material shapes.

Yasutomi et al. discloses a conductive ceramic in which the sintered body has porosity of 5 to 30%. The particle of the compound may be a whisker or a particle.  
(abstract, figures, cols. 1-3)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a whisker or particle as a starter material and have a range of porosity such as taught by Yasutomi et al. in the Mustonen and Donaldson et al. system because these are merely variations of a standard electrode product.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Alexandra Elve whose telephone number is 571-272-1173. The examiner can normally be reached on 6:30-3:00 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 18, 2005.

A handwritten signature in black ink, appearing to be 'MA Elve', with a long horizontal line extending to the right.

M. Alexandra Elve  
Primary Examiner 1725